

### **Amendment to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims**

1. (Previously presented) A biodegradable polyurethane composite, comprising:  
a polyurethane matrix formed by a reaction of a polyisocyanate with a hydroxylated biomolecule to form a biodegradable polyurethane polymer; and  
a reinforcement embedded in the matrix, wherein the reinforcement comprises a material selected from the group consisting of bone and bone substitutes.
2. (Currently amended) The polyurethane composite of claim 1, wherein the reinforcement comprises a material selected from the group consisting of ~~calcium carbonate~~, calcium sulfate, calcium phosphosilicate, sodium phosphate, calcium aluminate, calcium phosphate, calcium carbonate, hydroxyapatite, demineralized bone, mineralized bone, and combinations and modified forms of the above.
3. (Original) The polyurethane composite of claim 1, wherein the biodegradable polyurethane polymer is cross-linked.
4. (Original) The polyurethane composite of claim 1, wherein the polyisocyanate is a diisocyanate.
5. (Currently amended) The polyurethane composite of claim 1, wherein the polyisocyanate is selected from the group consisting of lysine diisocyanate ~~diisocyanate~~, toluene diisocyanate, arginine diisocyanate, asparagines diisocyanate, glutamine diisocyanate, hexamethylene diisocyanate, hexane diisocyanate, methylene bis-p-phenyl diisocyanate,

isocyanurate polyisocyanates, 1,4-butane diisocyanate, uretdione polyisocyanate, and aliphatic, alicyclic, and aromatic polyisocyanates.

6. (Original) The polyurethane composite of claim 1, wherein the biomolecule is selected from the group consisting of phospholipids, fatty acids, cholesterol, polysaccharides, starches, and combinations and modified forms of the above.
7. (Original) The polyurethane composite of claim 1, wherein the biomolecule is lecithin.
8. (Original) The polyurethane composite of claim 1, further comprising polycaprolactone.
9. (Original) The polyurethane composite of claim 1, further comprising one or more substances selected from a biomolecule, a bioactive agent, and a small molecule.
10. (Original) The polyurethane composite of claim 9, wherein the substance is selected from the group consisting of lectins, growth factors, immunosuppressives, and chemoattractants.
11. (Original) The polyurethane composite of claim 1, comprising at least 10 weight percent of the reinforcement.
12. (Original) The polyurethane composite of claim 1, comprising at least 30 weight percent of the reinforcement.
13. (Original) The polyurethane composite of claim 1, comprising at least 50 weight percent of the reinforcement.

14. (Original) The polyurethane composite of claim 1, comprising at least 70 weight percent of the reinforcement.
15. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite has a wet compressive strength that exceeds the wet compressive strength of the polyurethane alone.
16. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite has a wet compressive strength of at least 3 MPa.
17. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite has a wet compressive strength of at least 10 MPa.
18. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite has a wet compressive strength of at least 50 MPa.
19. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite has a wet compressive strength of at least 75 MPa.
20. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite has a wet compressive strength of at least 100 MPa.
21. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite does not fail when subjected to at least  $10^5$  fatigue cycles at 3 MPa when wet.
22. (Original) The polyurethane composite of claim 1, wherein the polyurethane composite does not fail when subjected to at least  $10^6$  fatigue cycles at 25 MPa when wet.

23. (Original) The polyurethane composite of claim 1, wherein the polyurethane has a creep rate of less than 15% in 24 hours at 3 MPa when wet.
24. (Original) The polyurethane composite of claim 1, wherein the polyurethane has a creep rate of less than 10% in 24 hours at 25 MPa when wet.
25. (Original) The polyurethane composite of claim 1, wherein the polyurethane degrades at a rate sufficient to permit generation of new tissue at an *in vivo* implantation site.
26. (Original) The polyurethane composite of claim 1, wherein the polyurethane degrades at a rate of about 5% of original composite weight per month when implanted *in vivo*.
27. (Original) The polyurethane composite of claim 1, wherein the polyurethane degrades at a rate of about 10% of original composite weight per month when implanted *in vivo*.
28. (Original) The polyurethane composite of claim 1, wherein the polyurethane degrades at a rate of about 25% of original composite weight per month when implanted *in vivo*.
29. (Original) The polyurethane composite of claim 1, wherein the polyurethane has a maximum resolved shear strength of at least 3 MPa.
30. (Original) The polyurethane composite of claim 1, wherein the polyurethane has a maximum resolved compressive strength of at least 3 MPa.
31. (Original) The polyurethane composite of claim 1, wherein the polyurethane has a maximum resolved tensile strength of at least 3 MPa.
- 32.-111. (Cancelled)

112. (Previously presented) A biodegradable polyurethane composite, comprising:  
a polyurethane matrix formed by a reaction of a polyisocyanate with a biomolecule to form a biodegradable polyurethane polymer; and  
a reinforcement embedded in the matrix, wherein the reinforcement comprises a material selected from the group consisting of bone and bone substitutes.